COMPARATIVE ANALYSIS OF SELECTED PHYSIOLOGICAL PARAMETERS AMONG INTER-COLLEGIATE MALE PLAYERS PRACTICING GAMES WITH AND WITHOUT WEIGHT TRAINING

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SWAMI RAMANAND TEERTH MARATHWADA UNIVERSITY, NANDED

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Submitted By

MORAJKAR AVIDH ANAND

Asagao- Mapusa Taluka- Bardez Dist- North Goa

Under the guidance of

DR. Gajmal Nagnath

Department of PhysicalEducation

Research Centre

School of Educational Science,

Swami Ramanand Teerth Marathwada University, Nanded.

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Chapter 1: Introduction

Physical Fitness is mainly defined as the ability to perform day to day activity without feeling fatigued and with optimal performance, endurance, and strength (Campbell, N., De Jesus, S., Prapavessis, H.,2013). Physical fitness refers to physiological state of well-being with the ability to meet one's daily living demands and provides basis for better sports performance (Darren E.R. Warburton, Crystal Whitney Nicol and Shannon S.D. Bredin, 2006). Thus, being physically fit is of utmost importance to live a healthy life and attain a physiological well-being as well as to become a successful sports player.

The non-performance components of physical fitness are referred to as physiological fitness or physiological characteristics. These components are related to biological system which are influenced by one's level of physical activity (Bouchard, et al., 1990). Some of the sub-components of physiological fitness are metabolic fitness, morphological fitness, and bone integrity (Corbin, Charles B.; Pangrazi, Robert P.; Franks, B. Don,2000). Furthermore, these subcomponents include physiological characteristics like, BMR (Basal Metabolic Rate), visceral fat. Subcutaneous fats, Fat-free weight, Skeletal Muscles, Bone mass, metabolic age, Muscle mass, protein and so on.

To become physically fit, so as to attain physiological well-being, it is very important to indulge in some kind of physical activity. One can choose any kind of a physical activity from various options available in today's world. Weight training is of the options widely chosen by young generation, especially the college going students. Weight training in a type of strength training that uses weights for resistance and helps in developing size of skeleton muscle (Keogh, Justin W, and Paul W Winwood,2017). According to Source for Sports (2021), Weight training leads to change in body composition, helps to increase metabolism, promotes muscle gain as well as it reduces the risk of diseases. According to Mayo Clinic (2021), strength training stops bone loss and can help to build new bone mass. Weight training can be varied accordingly to goals and needs of the person.

Many factors play a crucial role for the success in the sports and to become outstanding athlete. To be an optimum sport player, both skills practice and fitness trainings are of utmost importance. Some athletes do not prefer to do additional fitness trainings which might hinder their overall development to play sports at higher levels. Thus, along with skills practice sessions, different types of fitness training sessions are employed for the athletes to get better outcomes. Weight training is one of the various fitness training programs that helps athletes get optimal improvements in performance. Versatile methods of weight training can be used to improve overall sports performance. Hence to achieve desired and optimal results, weight training can be structured and programed to vary the load, range of repetitions and speed of the movement of weight (Lee Bell,2020).

As the weight training helps in developments of physiological fitness, researcher aims to analyse the selected physiological characteristics:BMR (Basal Metabolic Rate), visceral fat. Subcutaneous fats, Fat-free weight, Skeletal Muscles, Bone mass, metabolic age, Muscle

mass, protein) of inter-collegiate sports players performing weight training and not performing weight training.

Statement of the problem

As fitness has become very crucial now a days, individuals find different ways and types of means and methods of engaging into fitness activities. The way fitness is important for everyone to live peaceful and happy life, it is also much more important for sports players to develop their overall fitness which included mental as well as physical. For this reason, sports players engage in various fitness activities for their holistic development. One of the important methods of fitness is weight training which many people practice in order achieve a good lifestyle. Weigh training has been already proved to be one of the dominant training methods for fitness. Initially sports players at lower levels fails to maintain proper fitness or mostly do not engage in weight training. Hence researcher decided to compare the physiological characteristics of intercollegiate sports players who perform weight training and who do not perform weight training for fitness.

Significance of the problem

- This study will help in understanding the importance of weight training, specially to the sports players for their overall development in order to excel in sports.
- This study will influence the sports players to give a priority to weight training method of fitness considering it's tremendous amount of benefits on physiological characteristics.
- This study will lead to the awareness to all the coaches, fitness trainers and other professionals from different regions who all are unaware of the importance of weight training in fitness programme for optimum development.

Objectives

- To measure the BMR (Basal Metabolic rate) of intercollegiate male players practicing games with and without weight training for fitness.
- To measure the Visceral Fat of intercollegiate male players practicing games with and without weight training for fitness.
- To measure the Subcutaneous fat of intercollegiate male players practicing games with and without weight training for fitness
- To measure the Fat-Free Weight of intercollegiate male players practicing games with and without weight training for fitness.
- To measure the Skeletal Muscles of intercollegiate male players practicing games with and without weight training for fitness.
- To measure the Bone Mass of intercollegiate male players practicing games with and without weight training for fitness.
- To measure the Metabolic Age of intercollegiate male players practicing games with and without weight training for fitness.
- To measure the Muscle Mass of intercollegiate male players practicing games with and without weight training for fitness.
- To measure the Protein of intercollegiate male players practicing games with and without weight training for fitness.

- To Measure and compare selected Physiological Parameters among intercollegiate male players practicing games with and without weight training for fitness.

Hypothesis

- H1 There will be significant difference in BMR(Basal Metabolic rate) of intercollegiate male players practicing games with and without weight training for fitness.
- H2 There will be significant difference in Visceral fat of intercollegiate male players practicing games with and without weight training for fitness.
- H3 There will be significant difference in Subcutaneous fat of intercollegiate male players practicing games with and without weight training for fitness.
- H4 There will be significant difference in Fat-Free Weight of intercollegiate male players practicing games with and without weight training for fitness.
- H5 There will be significant difference in Skeletal Muscles of intercollegiate male players practicing games with and without weight training for fitness.
- H6 There will be significant difference in Bone Mass of intercollegiate male players practicing games with and without weight training for fitness.
- H7 There will be significant difference in Metabolic Age of intercollegiate male players practicing games with and without weight training for fitness.
- H8 There will be significant difference in Muscle Mass of intercollegiate male players practicing games with and without weight training for fitness.
- H9 There will be significant difference in Protein) of intercollegiate male players practicing games with and without weight training for fitness.
- H10 There will be significant difference in selected Physiological Parameters among intercollegiate male players practicing games with and without weight training for fitness.

Chapter 2: Review of literature

The review of previous literatures from well-known recognized authors gives enough idea that the researcher is very well aware of the existing knowledge and what is still required to be known with the help of further research studies. As the effective and quality research is based upon how well the previous studies are taken into consideration which helps in finding revealing the unknown as well as avoid the repetition of work and ultimately it also provides suggestions and helps in framing the relevant hypothesis. This is the reason why review of most of the related literature becomes important and we must only consider most relevant and very well reported studies.

Klein, IE, White, JB, and Rana, SR: This study was conducted in order to compare the physiological variables between Elliptical bicycle and Run training in experienced runners. 12 experienced runners (age, 22.33 ± 3.33 years, running experience, 9.25 ± 4.53 years) completed 4 weeks of randomly administered EBIKE or run training program. In order to compare elliptical bicycle-only training (ET) with run training (RT), a randomized, crossover, training study design using matched 4-week exercise training periods of ET and RT in experienced runners was implemented. Again, the testing procedure were repeated and subjects than asked to perform again second same 4-week training period in a crossover design. The study revealed that the Ventilatory threshold was significantly greater after EBIKE ($p \leq 0.05$; 41.60 ± 6.15 $ml \cdot kg^{-1} \cdot min^{-1}$) and run training ($p \leq 0.05$; 42.33 ± 6.96 $ml \cdot kg^{-1} \cdot min^{-1}$) when compared with the initial time point (40.17 ± 6.47 $ml \cdot kg^{-1} \cdot min^{-1}$). No significant group difference ($p > 0.05$) was found in given variables at any point time. The study concluded that EBIKE-only training showed similar physiological and performance maintenance or improvements when compared with run-only raining.

Gregoire P Millet, V E Vleck, D J Bently: This study examined the physiological differences between cycling and running athletes. Physiological variables such as such as maximal oxygen consumption (V O(2max)), anaerobic threshold (AT), heart rate, economy or delta efficiency measured in cycling and running in triathletes, runners or cyclists, this review aims to identify the effects of exercise modality on the underlying mechanisms (ventilatory responses, blood flow, muscle oxidative capacity, peripheral innervation and neuromuscular fatigue) of adaptation.

Michael, R. D., Alastair, M. C., Erica, M.J., Jessica, L.T., Emily, K. G.: This study includes comparison of physiological variables in aged and young women during and following Sub-Maximal Exercise. Study aimed the assessment of influence of aging on exercise-induced responses by focusing on women. Sample of the study was 10 young (20.3 ± 0.3 years; mean ± SE) and 10 aged (75.5 ± 1.2 years) women and they performed 30 minutes of cycling at 60-65% of their pre-determined peak oxygen uptake. Data for respiratory exchange ratio (RER), heart rate, blood pressure, rectal temperature, and plasma metabolites were collected before exercise, at the 15th and 30th min of exercise, and at 5- and 15-min post exercise. After employing two-way, repeated measures ANOVA with main effects of age and time on each variable, findings showed that age affected exercise-induced responses of each variable quantified. Although RER, heart rate, temperature, and lactate were significantly ($P < 0.05$) higher among young women, blood pressure and glucose values were greater among aged women. The results indicate that aging impacts physiological

responses of women to prolonged endurance exercise even when relative intensity (% of peak oxygen uptake) is held constant.

Kaur, A., Singh, D.: The purpose of this study was to compare the physiological characteristics of high and low performance of male cricket players. Total 30 cricket players in which 30 were high performance and 30 were low performance were selected as sample from different colleges affiliated to Guru Nanak Dev University, Amritsar. The age group was 0.14 ± 1.10 years. 4 characteristics were included i.e.: Blood pressure (Systolic and Diastolic), Vital Capacity, heart Rate, and Resting Breathing frequency. After computing t-test the results showed that there was significant difference between high and low performance male cricket players with regards to blood pressure, heart rate and resting breathing frequency whereas there was no significant difference found in relation to vital capacity.

Elayaraja, M., Nageswaran, A.S., & Viswanathan, J.: The aim of this study was to evaluate the body proportions interms of body fat percentage, fat mass, fat-free mass & muscle mass of basketball players participated in All-India inter-collegiate basketball tournament organized at Banaras Hindu University, Varanasi, Utter Pradesh, India in 2009-10. 55 basketball players (15 guard, 22 forward & 18 post players) who had represented the state National basketball championship were selected as sample for the study through purposive sampling technique. The date was collected using weighing scale to measure body weight, stadiometer to measure body weight, Harpenden skinfold caliper to measure skinfold thickness- biceps, triceps, supra-iliac and subscapular to calculate % body fat, fat mass and fat-free mass.After computing descriptive statistics of mean and SD and one-way analysis of variance, the study results showed basketball players has high fat free mass, muscle mass and a normal BMI, but they had low had low fat mass and % body fat.

Chapter 3: Methodology

Participants and procedure

The sample for the study will be selected using non-probability convenient sampling technique which will include 100 Male inter-collegiate players practicing games with weight training and 100 male inter-collegiate players practicing games without weight training from various sports at Goa University sports championships.

The data will be collected during intercollegiate sports championships organised by Goa University by informing the sports players about the research study.

Tools

The data of thePhysiological parameters of male inter-collegiate players playing Goa university Inter-collegiate Sports will be collected using "Vandelay Sleek Smart Digital Bluetooth BMI Electronic Weighing Scale.The Vandelay Body Bathroom Weighing Machine for personal use is a very easy to use rectangle digital electronic weighing scale designed with a rugged ABS base and thick Tempered glass top. Strong, Heavy duty and of extremely high quality. Classic Luxurious White Wide Weighing scale.

Research Design and Statistical Analysis

Comparison of Physiological parameters of Goa University Inter-collegiate male players practicing games with weight training for fitness and practicing games without weight training for fitness will be done with the help of descriptive statistics in which Mean and Standard Deviation will be computed.

Further, the recorded data of both the groups will be analysed by applying independent sample t-test at 0.05 level of significance to identify the differences in Physiological Parameters of inter-collegiate male players.

Chapter 4: Discussion

As the fitness activities and fitness level of sports players play a crucial role in the overall development and to achieve success in highest level of competitions, the type of fitness activity that the athlete does, has to be taken into consideration. As playing sports and doing fitness activity helps in improvement of Physiological Parametes, this study is undertaken in order to measure and compare the physiological parameters of Goa University Inter-collegiate male players practicing games with weight training for fitness and practicing games without weight training for fitness.

Most of the sports players are not gifted with good genetics and having good level of physiological parameters to perform well in sports they are playing, but these parameters can be developed by doing right kind of fitness activities along with skill training. Fitness and well-developed physiological parameters play a dominant role becoming better sportsperson.

Fitness trainings which includes weight training programmes are given to athletes at highest levels of competitions to prepare them for the best of their abilities whereas at lower levels most of the athletes with good talents fails to get proper separate fitness training, while many sports players don't know the importance of weight training and do not include weight training sessions in the fitness activities. Hence leading to one of the major reasons for a sports player to getting dropped from playing sports at higher levels.

As proved in various studies, doing regular physical activities or fitness trainings helps in optimum development of an individual, thus if an athlete consistently works on the fitness through various fitness activities, it will ultimately help them to improve their fitness level which in turn will improve their physiological parameters.

Therefore, this study is undertaken in order to identify/measure the physiological parameters of Goa University Inter-collegiate male players and compare this parameters between sports players practicing games with weight training and players practicing games without weight training. Study will help in proving the importance of weight training for fitness for the optimum development of sports person.

Researcher is of the opinion that the players practicing games with weight training for fitness will have good fitness level with well-developed physiological parameters than those players practicing games without weight training for fitness.

TENTATIVE SCHEME OF CHAPTERISATION

To study the Impact of Bombay Jam Program on Selected Anthropometric, Physiological Parameters and Health Related Physical Fitness Components among Women of Goa. I am taking into consideration five chapters. The study will be consisting of five chapters. The chapter scheme of the research will be as following-

CHAPTER I- INTRODUCTION

This chapter deals with the introduction to the study.

CHAPTER II- REVIEW OF RELATED LITERATURE

The second chapter of thesis deals with the Review of Literature. Review of related literature is an instrument which helps the researcher in the selection of topic to carry out the research. It helps to frame ideas and to provide guidelines and support the needs of the researcher. A study of relevant literature is an essential step to get a clean idea of what has been done with regard to the problem under study.

CHAPTER III- RESEARCH METHODOLOGY

The third chapter of thesis deals with the Research Methodology. Research Methodology is the detailed method or technique; it is a process of collecting data for the purpose of the study. This chapter includes information about the method followed in the study, the sampling techniques used, tools used for data collection and the statistical tool and technique used for analyzing the collected data.

CHAPTER IV- ANALYSIS OF DATA AND INTERPRETATION OF RESULT

Collected data needs to be analyzed using statistical techniques and tools. This chapter tests the collected data and provides the findings of the study.

CHAPTER V- SUMMARY, CONCLUSIONS, RECOMMENDATIONS, BIBLIOGRAPHY AND APPENDICES.

This chapter summarizes in short the entire research work done for the current topic and with it presents the major findings of the study and conclusions are drawn based on the interpretation and findings. Further it puts forth the recommendations for further research work which can be carried out.

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Research Scholar **Research Supervisor**

Avidh A. Morajkar **Dr.Gajmal Nagnath**